

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference HAND0003P	<b>FOR FURTHER ACTION</b> see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US04/32296	International filing date ( <i>day/month/year</i> ) 29 September 2004 (29.09.2004)	(Earliest) Priority Date ( <i>day/month/year</i> ) 29 September 2003 (29.09.2003)
Applicant HANDHELD ENTERTAINMENT, INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 6 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the Report**

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).



- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2.



Certain claims were found **unsearchable** (See Box No. II)

3.



**Unity of invention** is lacking (See Box No. III)

4.

With regard to the **title**,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

5.

With regard to the **abstract**,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box "No. IV." The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6.

With regard to the **drawings**,

- a. the figure of the **drawings** to be published with the abstract is Figure No. 1



as suggested by the applicant.



as selected by this Authority, because the applicant failed to suggest a figure.



as selected by this Authority, because this figure better characterizes the invention.

- b. ☐

none of the figures is to be published with the abstract.

# INTERNATIONAL SEARCH REPORT

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## Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:  
Please See Continuation Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
  2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
- Remark on Protest** ☐ The additional search fees were accompanied by the applicant's protest.  
☐ No protest accompanied the payment of additional search fees.

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## Box IV TEXT OF THE ABSTRACT (Continuation of Item 5 of the first sheet)

The technical features mentioned in the abstract do not include a reference sign between parentheses (PCT Rule 8.1(d)).

### NEW ABSTRACT

The invention provides a method and apparatus for coding information (fig. 5) that is specifically adapted for smaller presentation formats, such as in a hand held video player (fig. 1). The invention addresses, inter alia, reducing the complexity of video decoding (55), implementation of an MP3 decoder (56) using fixed point arithmetic, fast YcbCr to RGB conversion, encapsulation of a video stream and an MP3 audio stream into an AVI file, storing menu navigation and DVD subpicture information on a memory card, synchronization of audio and video streams, encryption of keys that are used for decryption of multimedia data (fig. 3), and very user interface (UI) adaptations for a hand held video player that implements the improved coding invention herein disclosed.

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

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10/574159

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

IP5 Rec'd PCT/PTO 28 MAR 2006

V. 2. Citations and Explanations:

1. Claims 1-3 lack novelty under PCT Article 33(2) as being anticipated by Boykin et al, US 2003/0079222.  
Re claims 1-3, the technical features as claimed are fully disclosed by Boykin. (See figs. 44 & 48, para. 0035, 0140, 0180, 0195).
2. Claim 4 meets the criteria set out in PCT Article 33(2)-(4), because the prior art does not teach or fairly suggest the technical features of synchronizing audio and video by assigning each decompressed video frame in a video stream a unique ID; assigning each audio packet in an audio stream a unique ID; using an AV sync code to monitor the IDs of a latest rendered video frame and audio packet; recalculating the IDs into real time stamps every time a video interrupt occurs; and using the AV sync code to compare the time stamps and determine whether a next video frame must be repeated or dropped, wherein the audio stream is never adjusted, and wherein the video frames are either skipped or repeated to fit a current audio position.
3. Claims 5-6 meet the criteria set out in PCT Article 33(2)-(4), because the prior art does not teach or fairly suggest the technical features of reducing the complexity of MPEG4 decoding by the combination of disabling intra AC prediction; disabling motion compensation rounding control; combining VLD and inverse quantization into one step; and simplifying inverse DCT with a significance map as claimed.
4. Claim 7 lacks novelty under PCT Article 33(2) as being anticipated by Haskell et al, US 6,341,144.  
Re claim 7, the technical features as claimed are fully disclosed by Haskell. (See fig. 4, col. 6, lines 10-27).
5. Claim 8 lacks novelty under PCT Article 33(2) as being anticipated by Kazui et al, US 2004/0032969.  
Re claim 8, the technical features as claimed are fully disclosed by Kazui. (See fig. 4, para. 0047 - 0050).
6. Claim 9 lack an inventive step under PCT Article 33(3) as being obvious over Lan et al, US 2003/0095603.  
Re claim 9, the technical features as claimed are fully disclosed by Lan (see fig. 42, element 42, para. 0029) except Lan discloses only MPEG2 decoding and is silent on MPEG4 decoding. However, MPEG4 is an extension of MPEG2, and one skilled in the art would have found it obvious to modify the technique of combining variable length decoding and dequantization into one step as taught in Lan for MPEG4 decoding for the benefit of reduced bit rate object based coding.
7. Claims 10-11 lack novelty under PCT Article 33(2) as being anticipated by Pearson et al, US 2004/0263361.  
Re claims 10-11, the technical features as claimed are fully disclosed by Pearson et al. (See para 0039-0042).

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## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : H04N 7/12

US CL : 375/240.15, 240.2, 240.25, 240.27, 240.28, 240.29; 348/453, 515, 596, 729; 704/500; 380/239

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 375/240.15, 240.2, 240.25-240.29; 348/453, 515, 596, 729; 704/500; 380/239

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
EAST

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2003/0079222 A1 (BOYKIN et al) 24 April 2003, figs. 9, 43 & 48, para. 0035, 0134-0143, 0140, 0174-0179, 0180, 0195.	1-3, 28-33
—		
Y		17-22
X	US 6,341,144 B1 (HASKELL et al) 22 January 2002, fig. 4, col. 6, lines 10-27.	7
X,P	US 2004/0032969 A1 (KAZUI et al) 19 February 2004, para 0047.	8
Y	US 2003/0095603 A1 (LAN et al), 22 May 2003, fig. 4, para 0029.	9
X, P	US 2004/0263361 A1 (PEARSON et al) 30 December 2004, para. 0039-0042.	10-11
X	US 5,940,089 A (DILLIPLANE et al) 17 August 1999, col. 7, line 51 to col. 8, line 13.	12
X	US 2004/0093208 A1 (YIN) 13 May 2004, fig. 3, para. 0015, 0056-0071.	23
—		
Y		24-26



Further documents are listed in the continuation of Box C.



See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

18 January 2005 (18.01.2005)

Date of mailing of the international search report

28 FEB 2005

Name and mailing address of the ISA/US

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**INTERNATIONAL SEARCH REPORT**International application No.  
PCT/US04/32296**C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/0118845 A1 (HENN et al) 29 August 2002, fig. 7, para. 0031-0033.	27

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## BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

1. This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group 1, claims 1-3 pertain to a real-time video decoder for a mobile device, classified in class 375/240.25.

Group 2, claim 4 pertains to a method of synchronization of audio and video data, classified in class 375/240.28; 348/515.

Group 3, claims 5-11 pertain to methods of reducing complexities of MPEG4 decoding, classified in class 375/240.27, 240.29.

Group 4, claims 12-16 pertain to a method of fast YUV to "RGB555" conversion, classified in class 348/453.

Group 5, claims 17-18 pertain to a method of compression B-frames, classified in class 375/240.15.

Group 6, claims 19-22 pertain to a method of fast fixed point implementation of an MPEG-1 Layer 3 decoding, classified in class 704/500.

Group 7, claims 23-26 pertain to a method for computational speedup of inverse modified discrete cosine transform, classified in class 375/240.2.

Group 8, claim 27 pertains to a method for computational speedup of final windowing in audio/visual (AV) decoder, classified in class 348/596.

Group 9, claims 28-31 pertain to a multimedia file format for compression/decompression facility classified in class 348/729.

Group 10, claims 32-33 pertain to a multimedia encryption method classified in class 380/239.